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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/827,331	04/20/2004	Hiroyuki Kanaya	252067US2S	2930
22850	7590	07/13/2005		
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER LANDAU, MATTHEW C	
			ART UNIT	PAPER NUMBER
			2815	

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/827,331

Applicant(s)

KANAYA ET AL.

Examiner

Matthew Landau

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 13 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 3,4,6,7,13-17,19 and 20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,5,8-12 and 18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4/20/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election without traverse of Invention I (claims 1-17), Species I (Figure 1) in the reply filed on 6/13/2005 is acknowledged.

Claims 3, 4, 6, 7, 13-17, 19, and 20 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention/species, there being no allowable generic or linking claim. Note that claim 18 links inventions I and II and shall therefore be examined with invention I.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 5, 8-10, 12, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Moise et al. (US Pat. 6,534,809, hereinafter Moise).

Regarding claims 1 and 18, Figure 1 of Moise discloses a switching element 106 formed on a semiconductor substrate 102; a first interconnect layer (112/114) formed on the semiconductor substrate and having a first wiring 114 connected to one terminal of the switching element; a ferroelectric capacitor 125 formed on the first interconnect layer and having a first electrode 124 connected to the one terminal of the switching element via the first wiring; a first protective film 118 formed on the ferroelectric capacitor and the first interconnect layer; a

Art Unit: 2815

second interconnect layer (134/136) formed on the first protective film and having a second wiring 136 connected to a second electrode 128/130 of the ferroelectric capacitor and a first interlayer insulating film 134 (silicon nitride) (col. 8, lines 20-23) having a dielectric constant of 4 or more; and a third interconnect layer (160/144) including at least one layer formed on the second interconnect layer having a third wiring 144 connected to the second wiring and a second interlayer insulating film 160 (SiLK or Black Diamond) (col. 8, lines 20-26) having a dielectric constant of less than 4. Regarding claim 18, the above device must be made by the claimed method.

Regarding claim 2, Moise discloses the first protective film 118 contains aluminum oxide (col. 13, lines 3-5).

Regarding claim 5, Figure 1 of Moise discloses the third interconnect layer has a second insulating film formed on the second interlayer insulating film and having a dielectric constant of 4 or more. Moise discloses a thin dielectric layer (silicon oxide) is between layers 134 and 160 (col. 8, lines 15-20). This thin silicon oxide layer can be considered the second insulating film.

Regarding claim 8, the product-by-process limitation “wherein the second and third wirings are formed by a reactive ion etching method” does not structurally/patentably distinguish the claimed invention over Moise.

Regarding claim 9, Moise discloses the second and third wirings (136 and 144, respectively) consist essentially of aluminum (col. 8, lines 29-31).

Regarding claim 10, Moise discloses that a thin dielectric layer (plasma silicon oxide) can be between the dielectric layers 112, 134, and 160 (col. 8, lines 15-20). Therefore, the thin

Art Unit: 2815

dielectric layer can alternatively be considered the first interlayer insulating film. Note that silicon oxide has a dielectric constant greater than 4.

Regarding claim 11, Moise discloses the second interlayer insulating film 134 consists of Black Diamond (col. 8, lines 20-26). It is known in the art that Black Diamond consists essentially of carbon doped silicon oxide (i.e.,  $\text{Si}_x\text{O}_y\text{C}_z$ ).

Regarding claim 12, Moise discloses the second interlayer insulating film 134 consists of SiLK (col. 8, lines 20-26). It is known in the art that SiLK inherently includes a  $\text{C}_x\text{H}_y$  structure.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Landau whose telephone number is (571) 272-1731.

The examiner can normally be reached from 8:30 AM - 5:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

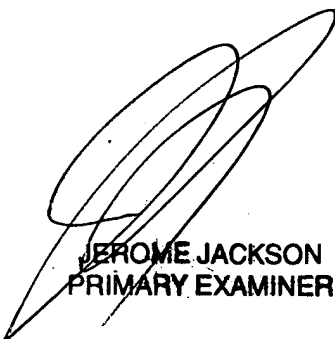
Art Unit: 2815

system, see <http://pair-direct.uspto.gov>. Should any questions arise regarding access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Matthew C. Landau

Examiner

July 6, 2005



JEROME JACKSON  
PRIMARY EXAMINER